BATTERY CALCULATIONS
FAP–001 & –001A–50

ITEM	DESCRIPTION	QTY	STANDBY CURRENT PER ITEM (AMPS)	TOTAL STANDBY CURRENT PER ITEM	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP–35	FACP w/2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS–35	POWER SUPPLY	2	0.0000	0.0000	0.0000	0.0000
BC–35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
AA–30U	CLASS B BELL MODULE	2	0.0065	0.0130	0.0400	0.0800
PM–32	MATRIX MODULE	1	0.0000	0.0000	0.0000	0.0000
RM–30U	RELEASE MODULE	1	0.0050	0.0050	1.5000	1.5000
SM–30	SWITCH MODULE	6	0.0000	0.0000	0.0450	0.2700
SR–35	8 RELAY MODULE	2	0.0000	0.0000	0.0210	0.0420
TC–30U	BATTERY TROUBLE	1	0.0300	0.0300	0.0500	0.0500
ZN–34US	SUPERVISORY MODULE	5	0.0100	0.0500	0.1100	0.5500
ZU–35	ZONE MODULE	5	0.0090	0.0450	0.1100	0.5500
ZU–35DS	ZONE MODULE/SD's	11	0.0090	0.0990	0.1100	1.2100
SMOKE	SMOKE DETECTOR	142	0.0001	0.0142	0.0010	0.1420
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	2	0.0020	0.0040	0.0000	0.0000
PS–5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						2.7490
	TOTAL SYSTEM CURRENT		STANDBY	0.6317	ALARM	7.7740

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) +
(TOT. ALARM CURRENT X ALARM TIME)} X 1.25

MIN. BATTERY CAPACITY = {(0.6317 A X 24 HR) + (7.774 A X 0.083 HR)} X 1.25

MIN. BATTERY CAPACITY = {15.1608 AHr + 0.6452 AHr} X 1.25 = 19.7576 AHr

NOTIFICATION APPLIANCE CIRCUIT
VOLTAGE DROP & POWER REQUIREMENTS

CKT AV1 – BLDG 50 DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELOCK STROBE 15 cd	–	0.5010	0.0000
WHEELOCK HORN/STROBE 15cd	–	0.0000	0.0000
WHEELOCK STROBE 30 cd	–	0.0300	0.0000
WHEELOCK HORN/STROBE 30 cd	–	0.0450	0.0000
WHEELOCK STROBE 75 cd	–	0.0210	0.0000
WHEELOCK HORN/STROBE 75 cd	–	0.1100	0.0000
WHEELOCK STROBE 110 cd	–	0.1100	0.0000
WHEELOCK HORN/STROBE 110 cd	7	0.3070	2.1490
WHEELOCK HORN	–	0.0000	0.0000
AUTOCALL BELL	12	0.0500	0.6000
TOTAL NOTIFICATION APPLIANCES CURRENT			2.7490

VOLTAGE DROP (VD) CALCULATIONS

VD = {() (D) (21.6)}/CM

WHERE: I = CIRCUIT CURRENT

D = CONDUCTOR LENGTH (FT) ONE WAY

21.6 = A CONSTANT

CM = CIRCULAR MILS

VD = {(2.749A) (250FT) (21.64)}/4110 = 3.612V

%VD = {0.767V / 24V} X 100 = 15.094%

REMAINING VOLTS = 20.388

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

FIRE ALARM SYSTEM FUNCTION CHART

SYSTEM EVENT / RESPONSE	ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE NOTIFICATION APPLIANCES	ELEVATOR RECALL	RELEASE DOOR HOLDERS
FIRE CALL BOXES	●	●			●	●	●
HEAT DETECTORS	●	●			●	●	●
SMOKE DETECTORS	●	●			●	●	●
FIRE SPRINKLER WATERFLOW SWITCHES	●	●			●	●	●
SD's–ELEV. LOBBIES, HOISTWAY & MACH. RM	●	●			●	●	●
HSSD 5th FLR	●	●			●	●	●
HSSD 6th FLR	●	●			●	●	●
FIRE SPRINKLER VALVE SUPERVISORY SWITCHES	●			●			
HSSD 5th FLR TROUBLE	●		●				
HSSD 6th FLR TROUBLE	●		●				
HSSD POWER SUPPLY	●		●				
AC POWER FAILURE	●		●				
SYSTEM FAULT	●		●				

REVISION NUMBER	DRAWN BY	CHECKED BY	APPR'D BY	DATE	REMARKS
_	LDD	LDD	MCD	09/17/13	AS BUILT

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)

ISSUE (PROGRESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)

AS BUILT
_
_
09/17/13

BLDG 50 FIRE ALARM
FUNCTION CHART & CALCULATIONS
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UNIVERSITY OF CALIFORNIA
LAWRENCE BERKELEY NATIONAL LABORATORY
FACILITIES DIVISION

DRAWN BY	LDD	09/17/2013
CHECKED BY	LDD	09/17/2013
APPROVED BY	MCD	09/17/2013
SCALE	AS NOTED	
DRAWING NO.	4B50E167_	SHEET 1 OF 1
PROJECT NO.	000000	